

REMARKS/ARGUMENTS

Applicant thanks Examiner Lee for the telephone conference of March 30 wherein the independent claims were discussed. Applicant agreed to amend the claims using language from the specification so as to not create confusion with regard to actuation positions of the membrane. Applicant also agreed to restrict the independent claims to a micro-valve as described in U.S. 5,865,417 and U.S. 6,149,123 all owned by the same assignee and sharing at least one inventor.

1.0 Addressing Examiners remarks starting with ¶ 3 & 4,

Claims 1- 3, 5-8, 10-13 and 16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

1.1 Please find in the specification:

[0005] [Prior art] *As the inlet pressure in channel 520 increases the force required to open cantilever 300 increases; in addition, as the area of channel 400 increases the opening force also increases. Depending upon the actuation mechanism employed in region 130 of FIG. 1 membrane 200 may not expand outward uniformly; the membrane may expand in such a fashion that the cantilever remains unopened or insufficiently open to meet the design criteria.*

[The above is a description of the problem the instant invention solves.]

[0007] *In the present invention, the valve is configured as a normally closed valve with at least two pedestals, one in the position as described in U.S. 5,865,417 and one approximately 1 mm from the original pedestal toward the far cavity wall, as shown in FIG.*

3. The advantages of the current invention over the previous embodiment are several.

First, the membrane is stiffened and no longer can assume actuated positions which do not open the cantilever. Second, more force can now be transferred from the actuation mechanism to open the cantilever; this result further allows the line pressure to be increased to over 100 psig and the inlet ports expanded to at least 1 mm in diameter. Third, by stiffening the membrane and preventing alternate flexure modes of the membrane, greater latitude in placement of the first pedestal is gained.

and

[0016] ... *What is critical is that the second pedestal be of sufficient height such that upon actuation second pedestal encounters cantilever element 300 early in the actuation cycle and lifts it slightly to start flow through valve port 400.*

and

[0017] *The other function performed by second pedestal 240 is a stiffening of membrane 200 such that it may not flex upward while pedestal 210 stays relatively motionless during the actuation cycle. This situation is known to occur when forces greater than 50 psig are placed on cantilever element 300 over the area of valve seat 410 in the direction of port 400.*

This condition can be catastrophic when the burst strength of membrane 200 is less than the force required to open the valve and less than the actuation pressure applied internally.

1.2 Please note:

A) The problem as stated in [0005] is the membrane flexing out in such a manner that the cantilever stays in place and the inlet port remains covered.

B) When the valve actuates, properly, a "means for stiffening", optionally, by design, a second pedestal or rib membrane, is placed between the membrane and the cantilever element, such that upon actuation and early in the actuation cycle the "means for stiffening" encounters the cantilever and forces it to open the inlet port. Alternatively, a second pedestal is placed on the cantilever and now the membrane encounters this second pedestal early in the actuation cycle and forces the cantilever to open the inlet port.

1.3 Claims 1-3, 5-8 and 10-13 are rejected under 35 U.S.C. S 112, first paragraph, as failing to comply with the enablement requirement. In essence, the Examiner is objecting to the language, which previously appeared in all of the independent claims, and which states :

"flexible membrane is prevented from flexing in alternate flexure modes, whereby the flexible membrane can assume only actuated positions that open the cantilever with respect to the inlet port."

Applicant has amended the independent claims as mutually agreed by the Examiner and Applicant in the telephone conversation of March 30.

1.4 The essence of the current rejection seems to be that, although textual support for the

claim language does exist in the present specification to enable a person skilled in the art to make and/or use the invention. Applicant respectfully asserts that this rejection is unsustainable because to make and use the present invention, all one needs to do is to provide a means for stiffening, such as a second pedestal (240 or 245) substantially as shown by FIG. 3A or FIG. 3B. Moreover, FIG. 5 indicates precisely the positioning in microns of the first and second pedestals 210 and 240. How to construct and use the present invention is fully taught in this specification as well as the referenced patents, U.S. 5,865,417 and U.S. 6,149,123.

1.5 In summary, applicant respectfully asserts that when the content of the Figures is studied in detail, along with the other dimensional details given in the present specification, it is clear to one knowledgeable in the art how the invention operates, and that the present specification adequately teaches how to construct and use the valve in such a manner that, the membrane and a means for stiffening encounters the cantilever and forces it open.

2.0 Addressing Examiners remarks starting with ¶ 5,

Claims 1- 3, 5-8, 10-13 and 16 are rejected under 35 U.S.C. S 103(a) as being unpatentable over Harris et al. (U.S. Patent No. 6,149,123) in view of Nestler et al. (U.S. Patent No. 5,040,567).

2.1 MPEP § 2143.01 provides: *"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)."*

The Federal Circuit has several times expressly addressed the issue of how to evaluate an alleged case of *prima facie* obviousness to determine whether it has been properly made. Thus, *In re Geiger, supra*, stated, in holding that the PTO "failed to establish a *prima facie* case of obviousness":

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. ACS Hospital Systems, Inc. v. Monteffiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984).

There is no suggestion in Harris [123] or Nestler [567] for a combination.

2.2 The Examiner acknowledges that Harris et al. do not disclose or suggest the second pedestal as defined in claims 1 and 6. The Examiner asserts, however, that a second pedestal is disclosed by element 20C in Nestler et al. According to Nestler et al., the actuating member 20 includes "lateral edges 20C bent at right angles" as shown in FIG. 2. Notably, the lateral edge 20C project upwardly, in a direction away from the valve base (the base 10, as shown in FIG. 1 of Nestler, corresponds with the claimed cantilever). Presumably, therefore, the Examiner's purported combination would be to provide similar upwardly projecting lateral edges on the flexible member (200) disclosed in Harris et al. Such a combination, however, would lead to lateral edges that project upwardly from the flexible member (200) in a direction away from (not toward) the cantilever (300), as currently claimed.

2.3 The combination of Harris et al. and Nestler et al. would result in a structure opposite to what is now recited in claims 1 and 6, namely, wherein the means for stiffening (240) projects from the flexible membrane (200) toward the cantilever element (300). Since the proposed combination leads away from the features recited in claims 1 and 6, the amended claims clearly are patentable over the cited prior art.

2.4 With respect to claim 16, as discussed above, claim 16 recites the features of a first pedestal (210) and a second pedestal (245), in particular, wherein the second pedestal (245) is attached to the cantilever element (300) and projects from the cantilever element (300) toward the flexible membrane (200). Stated otherwise, according to the present invention and as claimed, the second pedestal is positioned on the non-flexing cantilever (300) and projects toward the flexible member (200).

2.5 The features of claim 16 are completely absent from Nestler et al., and thus Applicant has difficulty understanding the Examiner's reasoning. That is, according to Nestler, the stiffening member, upwardly bent lateral edges 20C, are provided only on the flexible actuating member 20. Thus, at best, Nestler could only suggest providing similar lateral edges in some manner on the flexible membrane (200) of Harris et al. Stated otherwise, Nestler teaches use of the stiffening members, lateral edges 20C, only in association with the flexible actuating member, and nowhere else.

2.6 There is absolutely no teaching or suggestion in Nestler to provide a second pedestal (245) that is attached to the cantilever element (300) and which projects from the cantilever

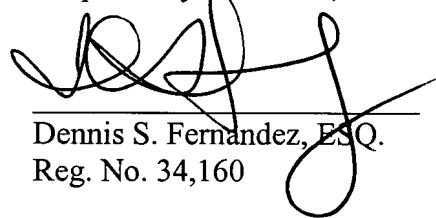
element (300) toward the flexible membrane (200), as set forth in claim 16. Therefore, the features of claim 16 are completely absent from the cited prior art.

In conclusion, Applicant has amended the independent claims to be more definitive with regard to the means for stiffening encountering the cantilever. Applicant has also restricted the independent claims to be in accord with U.S. 5,865,417 and U.S. 6,149,123.

Applicant has pointed out that two pedestals are not discussed or suggested by either Harris or Nestler. In addition there is no motivation in either for a combination; neither Harris or Nestler were aware of the problem the current invention solves.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,



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